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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/082,563	02/23/2002	Masahiro Ishida	ADV A225.001AUS	3180

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EXAMINER	
GHULAMALI, QUTBUDDIN	
ART UNIT	PAPER NUMBER
2637	

DATE MAILED: 06/13/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/082,563	ISHIDA ET AL.	
	Examiner	Art Unit	
	Qutub Ghulamali	2637	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 February 2002*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-33* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-8,13,14,17-24 and 32* is/are rejected.

7)☒ Claim(s) *9-12,15,16,25-31 and 33* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *7/8/02*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

1. Claims 1, 17 and 22 are objected to because of the following informalities:

Claims 1 and 17, line 6, recites "plurality of signals", whereas it should be "plurality of clock signals" for establishment of proper antecedent basis.

Claim 22, line 5, recite "cock skews", whereas it should be "clock skews".

Appropriate correction is required.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1, 2, 6, 7, 17 and 18 are rejected under 35 U.S.C. 102(e) as being anticipated by Gutnik et al (USP 6,661,860).

Regarding claim 1, Gutnik discloses a probability estimating apparatus for peak-to-peak values in clock skews (jitter) among a plurality of clock signals comprising:

a clock skew estimator (jitter estimation) for estimating clock skew sequences among the plurality of clock signals (SigA and SigB) under test (abstract; col. 5, lines 17-40); and

a probability estimator for determining a generation probability of the peak-to-peak values in the clock skews among the plurality of signals under test based on the clock skew sequences from the clock skew estimator (col. 6, lines 43-60; col. 10, lines 25-44).

Regarding claim 17, the steps claimed as method is nothing more than restating the function of the specific components of the apparatus as claimed in claim 1 above and therefore, it would have been obvious, considering the aforementioned rejection for the apparatus claim 1.

Regarding claims 2 and 18, Gutnik discloses probability estimator determines the generation probability of a peak value of the clock skews among the plurality of signals under test based on said clock skew sequences (col. 10, lines 33-44).

Regarding claim 6, Gutnik discloses clock skew estimator includes a second clock skew calculator (arbiter 12 #1-N) for receiving said clock skew sequences to determine the difference among the plurality of said clock skew sequences (col. 1, lines 44-46).

Regarding claim 7, Gutnik discloses clock skew estimator includes a frequency multiplier for receiving said timing jitter sequences and producing timing jitter sequences which are multiple of a frequency of said signals under test (col. 6, lines 11-21).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 3, 5, 8, 19, 21-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gutnik et al (USP 6,661,860) in view of Dalal et al (USP 6,661,836).

Regarding claims 5, 21 and 23, Gutnik discloses all limitation of the claim. Gutnik however, is silent regarding a timing jitter estimator for timing jitter sequences (patterns) of the clock signals and a clock skew calculator calculating timing differences in jitter. Dalal in a similar field of endeavor discloses a timing jitter estimator (fig. 6, element 745) for timing jitter sequences (patterns) of the clock signals and a clock skew calculator for receiving a plurality of timing jitter sequences (pattern) calculating timing differences in jitter (col. 4, lines 34-43; col. 5, lines 40-45). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use a timing jitter estimator for timing jitter sequences (patterns) of the clock signals and a clock skew calculator calculating timing differences in jitter as taught by Dalal in the circuit of Gutnik because it can provide measurement samples indicative of signal level relative to the threshold. Regarding claim 22, Gutnik discloses clock skew sequences includes a step of receiving said clock skew sequences and determining the difference among the plurrality of the clock skew sequences, thereby estimating the probability of peak-to-peak clock skews (col. 6, lines 43-60; col. 10, lines 25-44).

Regarding claims 8 and 24, Gutnik discloses all limitation of the claim except a step of estimating timing errors among ideal clock edges of clock signals to estimate deterministic components of clock skews. Dalal in a similar field of endeavor discloses estimating timing errors among ideal clock edges of clock signals to estimate deterministic components of clock skews (col. 2, lines 31-42). It would have been

obvious to a person of ordinary skill in the art at the time the invention was made to use a step of estimating timing errors among ideal clock edges of clock signals to estimate deterministic components of clock skews as taught by Dalal in the circuit of Gutnik because it can allow accurate position and time of every edge to be measured in a statistical based measurement of sample signals.

As per claim 3, Gutnik discloses all limitation of the claim except determining an RMS value of data of the clock skew (jitter), a memory for storing a predetermined value, and a probability calculator for determining the peak-to-peak clock skews (jitter) among signals under test exceeding the predetermined value and RMS value. Dalal in a similar field of endeavor discloses an RMS value of data of the clock skew (jitter) (col. 4, lines 27-30; col. 7, lines 60-67); a memory (750) for storing a predetermined value (col. 7, lines 62-64); and a probability calculator for determining the peak-to-peak clock skews (jitter) among signals under test exceeding the predetermined value and RMS value (col. 8, lines 1-6). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use a probability estimating means comprising an RMS determination, a memory for storage results and probability calculation of peak-to-peak skews in signals as taught by Dalal in the system of Gutnik so that accurate sampling and estimation with the jitter measurement can be made with greater confidence and ease.

Regarding claim 19, the steps claimed as method is nothing more than restating the function of the specific components of the apparatus claimed above and therefore, it would have been obvious, considering the aforementioned rejection for the apparatus claim 1.

6. Claims 4 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gutnik et al (USP 6,661,860) in view of Voorakaranam et al (Proceedings of the 43rd IEEE Midwest Symposium on Circuits and Systems, 2000).

Regarding claim 4, Gutnik discloses all limitation of the claim except an RMS detector, a peak-to-peak detector and a probability estimator. Voorakaranam in a similar field of endeavor discloses an RMS detector for determining an RMS value of data of the clock skew sequences supplied thereto (fig. 5, page 958, col. 1); a peak-to-peak detector for calculating maximum and minimum values of said clock skew sequence data to determine the peak-to-peak value (page 958, col. 2); and a probability calculator for determining the probability of the clock skews among the signals under test exceeding the peak-to-peak value based on said peak-to-peak value and said RMS value of the clock skew sequence data (page 958, col. 2; page 959, col. 1). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use RMS and peak-to-peak detection and jitter prediction (probability assessment) as taught by Voorakaranam in the system of Gutnik because it can provide a low cost detection and measurement of jitter for high speed signals.

Regarding claim 20, the steps claimed as method is nothing more than restating the function of the specific components of the apparatus claimed above and therefore, it would have been obvious, considering the aforementioned rejection for the apparatus claims 1, 17.

7. Claims 13, 14 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gutnik et al (USP 6,661,860) in view of Godard (USP 4654861).

Regarding claim 13, Gutnik discloses all limitations to above claims. However, Gutnik is silent regarding clock skew (jitter) estimator includes an A/D converter for converting signals under test. Godard in a similar field of endeavor discloses (fig. 1, element 18), an ADC for converting signals under test to digital signals (col. 3, lines 25-56). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use an ADC to convert the signals to digital signals as taught by Godard in the circuit of Gutnik so as to provide proper transformation of signals in the estimation process.

Regarding claims 14 and 32, Gutnik discloses all limitations to above claims however, Gutnik is silent regarding a step of conducting waveform clipping for the signals under test to remove amplitude modulation components in said signals under test thereby retaining only phase modulation components in said signals under test. Godard in a similar field of endeavor discloses limiting the signal to remove (clip) amplitude modulation in signals under test therefrom (col. 2, lines 18-19; col. 5, lines 50-56). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to remove amplitude modulation in signal as taught by Godard in the circuit of Gutnik so as to provide reasonably accurate phase jitter measurement and estimation.

Allowable Subject Matter

8. Claims 9-12, 15, 16, 25-31, 33 are objected to as being dependent upon rejected base claims, but would be allowable if rewritten in independent form including all of the limitations of the base claims and any intervening claims.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

US Patents:

Wong (USP 5402443) shows a device for measuring the jitter of a recovered clock signal.

Watanabe (USP 4542514) discloses a method of measuring quality of a signal received by a receiver.

Soma et al (USP 6775321) discloses an apparatus for measuring a jitter sequence.

Turker (USP 6640193) discloses a Method and system for measuring jitter

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Qutub Ghulamali whose telephone number is (571) 272-3014. The examiner can normally be reached on Monday-Friday from 8:00AM - 5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jay Patel can be reached on (571) 272-2988. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

QG.
June 7, 2005.

JAY K. PATEL
SUPERVISORY PATENT EXAMINER